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EDITORIAL

FUNCTIONAL TRICUSPID REGURGITATION:
FROM PATHOPHYSIOLOGY TO THE NOVEL PERCUTANEOUS APPROACHES

The growing clinical importance of functional tricuspid valve regurgitation

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The assessment and management of tricuspid valve (TV) disease have evolved substantially during the past several years. The increased understanding of the long-term adverse consequences of severe tricuspid regurgitation (TR), along with the continued advances in surgical and percutaneous techniques, has led to a renewed interest in the "forgotten valve".[1, 2]

In this special monographic issue of *Minerva Cardioangiologica*, entitled "*Functional tricuspid regurgitation: from pathophysiology to the novel percutaneous approaches*", we will have the privilege of outstanding state-of-the-art contributions, directly provided from the best worldwide experts of this challenging topic.

The TV disorders have traditionally been accorded lesser importance than that of the left-sided valvular heart disease. Rarely TR may be ascribed to a primary valve lesion; more frequently, a morphologically normal valve with annular dilatation and/or leaflet tethering due to right ventricular (RV) overload is encountered, the so-called "functional TR".

This is commonly consequence of a heart valve disease of the left-side, atrial fibrillation or pulmonary hypertension.[2] While trivial TR is frequently encountered in normal subjects, increasing severity of TR has been associated with substantial morbidity and mortality: up to one third of patients with severe TR die within one year of diagnosis.[1] Avoiding TV repair in less than severe secondary TR has been tolerated for a long time, following the misleading belief that functional TR would reduce or even disappear once the left-sided pathology had been resolved. However, half of all patients with untreated TR developed progressive valve dysfunction, despite successful left-sided surgery, entailing a poor prognosis.[1, 3, 4] The increased understanding of the long-term adverse consequences of severe TR, coupled with continued advances in surgical and percutaneous techniques, is currently leading to a more aggressive treatment strategy. The European guidelines recommend TV repair during left-heart surgery in the presence of severe TR (class I; level of evidence C), moderate primary TR (IIa; C), and ≥mild TR with annular dilatation (≥40 mm) (IIa; C). Surgical repair is also recommended in symptomatic patients with severe primary TR (I; C) or in asymptomatic patients with progressive RV dilatation (IIa; C).[5] There is general recognition, however, that the evidence underlying current guideline recommendations for management of patients

with TV disease does not include any sufficiently rigorous randomized controlled trials to guide the clinical practice.[5, 6]

In this monographic issue, entirely dedicated to functional TR, the first contribution is by Patrick O'Gara from the Boston Harvard Medical School and Brigham and Women's Hospital, discussing in greater detail the TV complex anatomy, the epidemiology of TV disease and the increasing evidence that functional TR is prognostically significant, warranting intervention. The appropriate patient selection for intervention along with the proper timing will also be addressed.[7]

Rebecca Hahn from the Columbia University and New York-Presbyterian Hospital will introduce the readers to a controversial and challenging topic, the echocardiographic criteria relevant to assess functional TR severity and the pre-procedural degree of RV (dys) function.[8]

Ottavio Alfieri *et al.* from the San Raffaele University Hospital of Milan, will report the techniques, the acute and long-term outcomes provided by TV surgery, addressing the evidences in favor of a more aggressive surgical approach to functional TR.[9]

The clinical need forecasting transcatheter tricuspid therapies and the Heart Team approach to assess patients' operability will be analyzed by Alec Vahanian, from the Bichat University Hospital, Paris.[10]

Another fundamental aspect of the monography relies on the preliminary experiences of transcatheter treatments for functional TR in symptomatic inoperable patients, which are discussed by Josep Rodés-Cabau *et al.* from the Quebec Heart & Lung Institute and Laval University, Canada.[11]

The last original contribution, by Jeroen Bax *et al.* from the University Medical Center Leiden, will bring to the readers' attention the pivotal role played by multimodality imaging techniques in achieving procedural success and safety with the novel transcatheter devices.[12]

In conclusion, continued refinement of transcatheter techniques offers hope for less invasive means to treat severe TR in many patients deemed at prohibitive or high surgical risk. This special issue on functional TR contributes and shapes the future of TV interventions, defining the complementary role of medical, transcatheter and surgical therapies.

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Conflicts of interest.—Francesco Maisano is cofounder of 4Tech; Maurizio Taramasso is consultant for 4Tech.

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